Claims

1. A method for processing a biological sample contained in a liquid, said method comprising

(a) introducing said liquid into a chamber of a reaction vessel which comprises

a tubular body having a bottom wall an upper opening and side walls which extend between said bottom wall and said upper opening ,

said bottom wall and said side walls forming said chamber, and

a chip shaped carrier having an active surface which is formed by a plurality of biological polymers, said active surface being accessible to liquid contained in said chamber,

said chip shaped carrier being located in an opening of a side wall of said tubular body or on the inner surface of said side wall or in a recess formed in the inner surface of said side wall,

(b) positioning said reaction vessel in a vessel holder, and

(c) moving said vessel holder along a predetermined trajectory for causing a relative motion of a liquid contained in said chamber with respect to said active surface of said chip shaped carrier.

2. A method according to claim 1, wherein said moving is performed along a trajectory suitable for achieving a vortex mixing effect.

3. A method according to claim 1, wherein said moving is performed periodically with a predetermined frequency.

4. A method according to claim 3, wherein said frequency is higher than 1 cycle per second.

5. A system for processing a biological sample contained in a liquid, said system comprising

(a) a reaction vessel which comprises

a tubular body having a bottom wall, an upper opening and side walls which

extend between said bottom wall and said upper opening,

said bottom wall and said side walls forming said chamber, and

a chip shaped carrier having an active surface which is formed by an array of biological polymers, said active surface being accessible to liquid contained in said chamber,

said chip shaped carrier being located in an opening of a side wall of said tubular body or on the inner surface of said side wall or in a recess formed in the inner surface of said side wall,

(b) a vessel holder for holding said reaction vessel, and

(c) means for moving said vessel holder along a predetermined trajectory for causing a relative motion of the liquid contained in said chamber with respect to said active surface of said chip shaped carrier.

6. A system according to claim 5, which further comprises a heat transfer element for heating and cooling of the contents of the reaction vessel, said heat transfer element being located outside of the reaction vessel and being adapted to be put in contact with a thermal interface which is part of the tubular body of the reaction vessel.

7. A system according to claim 6, wherein said thermal interface is a zone of a side wall of said tubular body.

8. A system according to claim 5, wherein said chip shaped carrier is located in an opening of a said wall of said tubular body and has an outer surface adapted to be contacted by a heat transfer element located outside the reaction vessel, said system further comprising a heat transfer element for heating and cooling of the contents of the reaction vessel, said heat transfer element being located outside of the reaction vessel and being adapted to be put in contact with said outer surface of said chip shaped carrier.

9. A reaction vessel for processing a biological sample contained in a liquid, said reaction vessel comprising

(a) a tubular body having a bottom wall, an upper opening and side walls which extend between said bottom wall and said upper opening,

said bottom wall and said side walls forming a chamber for receiving a liquid to be

processed, and

(b) a chip shaped carrier having an active surface which is formed by a p;urality of biological polymers, said active surface being accessible to liquid contained in said chamber,

said chip shaped carrier being located in an opening of a side wall of said tubular body or on the inner surface of said side wall or in a recess formed in the inner surface of said side wall.

10. A reaction vessel according to claim 9, wherein said tubular body is so configured and dimensioned that said chamber is adapted to receive a predetermined amount of liquid and that when said chamber contains said amount of liquid and is at rest

there is an air space between the free surface of the liquid and said upper opening and

the entire surface of said active surface is in contact with the liquid contained in said chamber.

11. A reaction vessel according to claim 9, wherein the chip shaped carrier is located at a predetermined distance from the bottom wall and from the upper opening of said tubular body.

12. A reaction vessel according to claim 9, wherein said chip shaped carrier is transparent to enable performing electro-optical measurements of said active surface of said chip shaped carrier.

13. A reaction vessel according to claim 9, wherein said tubular body has a side wall located substantially in face of said active surface of said chip shaped carrier, said side wall having a transparent zone to enable performing electro-optical measurements of said active surface of said chip shaped carrier.

14. A reaction vessel according to claim 9, wherein said tubular body comprises a thermal interface adapted to be put in contact with a heat transfer element located outside of the reaction vessel, thereby enabling heating and cooling of the contents of the reaction vessel by means of said heat transfer element.

15. A reaction vessel according to claim 14, wherein said thermal interface is a zone of a side wall of said tubular body.

16. A reaction vessel according to claim 9, wherein said chip shaped carrier is located in an opening of a side wall of said tubular body and has an outer surface which is adapted to be contacted by a heat transfer element located outside of the reaction vessel.

17. A reaction vessel according to claim 9, wherein said chamber has an inner width larger than 1.5 millimeter at least in the region of the reaction vessel over which the active surface of the chip shaped carrier extends.

18. A reaction vessel according to claim 9, wherein said tubular body is so configured and dimensioned that said chamber is adapted to receive a predetermined amount of liquid lying in a range between 10 to 800 microliter.

19. A reaction vessel according to claim 9, wherein said tubular body is so configured and dimensioned that said chamber has approximately the shape of a cuboid having sides lengths which are equal or of the same order of magnitude.

20. A reaction vessel according to claim 19, wherein said cuboid has a side length of at least about 3 millimeter.

21. A reaction vessel according to claim 9, wherein the active surface of the chip shaped carrier has the shape of a square and the side length of this square lies in a range between 2 to 10 millimeter.

22. A reaction vessel according to claim 9, wherein said reaction vessel further comprises a cap for closing said upper opening of said tubular body, said cap being a removable closure of said opening.

23. A reaction vessel according to claim 22, wherein said cap is so configured and dimensioned that a part thereof is a transport interface adapted to cooperate with a gripper of a transport mechanism, cooperation of the gripper and the cap enabling automatic transport of the reaction vessel by means of said transport mechanism.

24. A reaction vessel according to claim 9, wherein liquid can only be introduced into and removed from said chamber through said upper opening of said tubular body.

25. A reaction vessel according to claim 1, further comprising a wall which carries a barcode label.